

EXHIBIT 2

Third Edition

ORGANIC CHEMISTRY

ROBERT THORNTON MORRISON

ROBERT NEILSON BOYD

New York University

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Chapter 31 | Heterocyclic Compounds

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31.1 Heterocyclic systems

A heterocyclic compound is one that contains a ring made up of more than one kind of atom.

In most of the cyclic compounds that we have studied so far—benzene, naphthalene, cyclohexanol, cyclopentadiene—the rings are made up only of carbon atoms; such compounds are called *homocyclic* or *alicyclic* compounds. But there are also rings containing, in addition to carbon, other kinds of atoms, most commonly nitrogen, oxygen, or sulfur. For example:



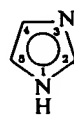
Pyrrole



Furan



Thiophene



Imidazole



Oxazole



Thiazole



Pyrazole



3-Pyrroline



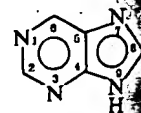
Pyrrolidine



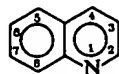
Pyridine



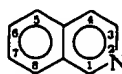
Pyrimidine



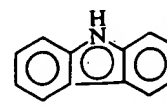
Purine



Quinoline



Isoquinoline



Carbazole

We notice that, in the numbering of ring positions, hetero atoms are generally given the lowest possible numbers.